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EXAMINER	
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ART UNIT	PAPER NUMBER
2831	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No.	Applicant(s)	
	10/587,442	AMATO, JOSEPH M.	
	Examiner	Art Unit	
	FARHANA HOQUE	2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15,18 and 20-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15, 18 and 20-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's arguments with respect to claims 1-15, 18 and 20-22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-15, 18 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas (U.S. Patent No. 3,808,527) in view of Look et al. (U.S. Patent No. 6,393,714 B1).

With respect to claim 1, Thomas discloses a structure comprising:

at least one proportional variable resistor suitable for electrically measuring unidirectional misalignment of stitched masks in etched interconnect layers, said variable resistor comprising (Fig. 1):

at least a first mask (Fig. 4) and a second mask (Fig. 2) that when superimposed comprise: at least two test pads [2-5] (see Fig. 1), wherein the two test pads [2-5] (see Fig. 1) are both formed by the first mask (Fig. 4); two interconnects [12, 66] (see Fig. 4) between the test pads [2-5] (see Fig. 1); wherein a resistance

between the test pads is dependent on a distance along the contact (col. 4, lines 2-4) between the interconnects [12, 66] (see Fig. 4), and the resistance is indicative of the misalignment of the first and second masks (col. 4, line 56-col. 5, line 21).

Thomas does not disclose a contact having a smaller width than the interconnects, wherein the contact is formed by the same mask as at least one of the interconnects.

Look et al. discloses a contact [115] (see Fig. 1A) having a smaller width than the interconnects [105, 110] (see Fig. 1A), wherein the contact [115] (see Fig. 1A) is formed by the same mask as at least one of the interconnects (see Fig. 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the structure of Thomas to include a contact having a smaller width than the interconnects, wherein the contact is formed by the same mask as at least one of the interconnects as taught by Look et al. to predictably reduce manufacturing costs.

With respect to claim 2, the combination of Thomas and Look et al. discloses the structure according to claim 1 wherein the variable resistor (see Thomas Fig. 1) comprises a directly proportional variable resistor which exhibits an increased resistance based on a greater distance along the contact (see

Thomas col. 4, lines 2-4) between the interconnects due [12, 66] (see Thomas Fig. 4) to a greater overlap of one of the interconnects with an adjacent test pad [2-5] (see Thomas Fig. 1).

With respect to claim 3, the combination of Thomas and Look et al. discloses the structure according to claim 1 wherein the variable resistor comprises an inversely proportional variable resistor (see Thomas Fig. 1) which exhibits a decreased resistance based on a shorter distance along the contact (see Thomas col. 4, lines 2-4) between the interconnects [12, 66] (see Thomas Fig. 4) due to a greater overlap of one of the interconnects with an adjacent test pad [2-5] (see Thomas Fig. 1).

With respect to claim 4, the combination of Thomas and Look et al. discloses the structure according to claim 1 wherein the interconnects comprise at least one stick type interconnect [12, 66] (see Thomas Fig. 4) of a substantially rectangular geometry (see Thomas Fig. 4).

With respect to claim 5, the combination of Thomas discloses the structure according to claim 1 wherein the interconnects comprise at least one hook type interconnect, wherein the hook type interconnect comprises:
an intermediate portion which is non-linear [12, 66] (see Thomas Fig. 4) within a plane of the corresponding mask (see Thomas Fig. 4); and two ends separated

by the intermediate portion, wherein both of the ends extend from the intermediate portion in substantially the same direction (see Thomas Fig. 4).

With respect to claim 6, Thomas discloses a system for electrically measuring unidirectional misalignment of stitched masks in etched interconnect layers, said system comprising:
at least one proportional variable resistor comprising:
a reference mask (Fig. 4) comprising at least two test pads [2-5] (see Fig. 1) and at least one interconnect [66] (see Fig. 4); and
a second mask comprising (Fig. 2) at least one interconnect [12] (see Fig. 2), and a contact [54, 64] (see Fig. 3; also col. 4, lines 2-4), wherein a resistance [ABSTRACT] between the test pads [2-5] (see Fig. 1) is dependent on a distance along the contact (see col. 4, lines 2-4) between the interconnects [12, 66] (see Fig. 4); and a probe [78, 80] (see Fig. 1) for testing the resistance between the test pads along said interconnect of said reference mask (Fig. 4) and said interconnect and said contact (col. 4, lines 2-4) of said second mask (Fig. 2) when said masks are superimposed (col. 4, lines 15-22).

Thomas does not disclose wherein the contact having a smaller width than the interconnects.

Look et al. discloses a contact [115] (see Fig. 1A) having a smaller width than the interconnects [105, 110] (see Fig. 1A).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the structure of Thomas to include a contact having a smaller width than the interconnects as taught by Look et al. to predictably reduce manufacturing costs.

With respect to claim 7, the combination of Thomas and Look et al. discloses the system according to claim 6, the at least one interconnect [66] (see Thomas Fig. 4) of said reference mask comprising at least one stick type interconnect of a substantially rectangular geometry (see Thomas Fig. 4).

With respect to claim 8, the combination of Thomas and Look et al. discloses the system according to claim 6, the at least one interconnect [66] (see Thomas Fig. 4) of said reference mask comprising at least one hook type interconnect, wherein the hook type interconnect comprises:
an intermediate portion which is non-linear [12, 66] (see Thomas Fig. 1) within a plane of the corresponding mask (see Thomas Fig. 4); and two ends separated by the intermediate portion, wherein both of the ends extend from the intermediate portion in substantially the same direction (see Thomas Fig. 4).

With respect to claim 9, the combination of Thomas and Look et al. discloses the system according to claim 6, the at least one interconnect [12] (see

Thomas Fig. 2) of said second mask comprising at least one stick type interconnect of a substantially rectangular geometry (see Thomas Fig. 2).

With respect to claim 10, the combination of Thomas and Look et al. discloses the system according to claim 6, the at least one interconnect of said second mask comprising at least one hook type interconnect [12] (see Thomas Fig. 2), wherein the hook type interconnect comprises:
an intermediate portion which is non-linear [12, 66] (see Thomas Fig. 1) within a plane of the corresponding mask (see Thomas Fig. 2); and two ends separated by the intermediate portion, wherein both of the ends extend from the intermediate portion in substantially the same direction (see Thomas Fig. 2).

With respect to claim 11, the combination of Thomas and Look et al. discloses the system according to claim 6, wherein the variable resistor (see Thomas Fig. 1) comprises an inversely proportional variable resistor which exhibits a decreased resistance based on a shorter distance along the contact (see Thomas col. 2, lines 2-4) between the interconnects [12, 66] (see Thomas Fig. 1) due to a greater overlap of one of the interconnects with an adjacent test pad [2-5] (see Thomas Fig. 4; also col. 4, lines 56-col. 5, lines 21).

With respect to claim 12, the combination of Thomas and Look et al. discloses the system according to claim 6, wherein the variable resistor

comprises a directly proportional variable resistor which exhibits an increased resistance based on a greater distance along the contact between the interconnects due to a greater overlap of one of the interconnects with an adjacent test pad [2-5] (see Thomas Fig. 4; also col. 4, line 56-col. 5, line 21).

With respect to claim 13, Thomas discloses a method of measuring stitched mask misalignment in etched interconnect layers, the method comprising: providing a reference mask (Fig. 4) comprising at least two test pads [2-5] (see Fig. 4) and at least one interconnect; providing a second mask (Fig. 2) comprising at least one interconnect [12] (see Fig. 2); superimposing said reference mask (Fig. 4) and said second mask (Fig. 2) to provide at least one proportional variable resistor (Fig. 1) between the test pads [2-5] (see Fig. 4) over the interconnect of the reference mask (see Fig. 4) and the interconnect [12, 66] (see Fig. 1) and the contact [54, 64] (see Fig. 3; also col. 4, lines 2-4) of the second mask (Fig. 2), wherein the resistance between the test pads is dependent on a distance along the contact [54, 64] (see Fig. 3; also col. 4, lines 2-4) between the interconnect [12, 66] (see Fig. 1) of the reference mask (see Fig. 4) and the interconnect of the second mask (Fig. 2); and
electrically measuring the resistance of said at least one proportional variable resistor [ABSTRACT].

Thomas does not disclose a contact having a smaller width than the interconnects on the second mask.

Look et al. discloses a contact [115] (see Fig. 1A) having a smaller width than the interconnects [105, 110] (see Fig. 1A)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the structure of Thomas to include a contact having a smaller width than the interconnect as taught by Look et al. to predictably reduce manufacturing costs.

With respect to claim 14, the combination of Thomas and Look et al. discloses the method according to claim 13 further comprising establishing an optimum resistance between said test pads [2-5] (see Fig. 4), wherein the optimum resistance corresponds to a configuration in which the reference mask (Fig. 4) and the second mask are aligned (Fig. 2).

With respect to claim 15, the combination of Thomas and Look et al. discloses the method according to claim 14 further comprising:
comparing the measured resistance to said optimum resistance; and
adjusting the position of said masks to alignment (see Thomas col. 5, lines 19-27).

With respect to claim 18, the combination of Thomas and Look et al.

discloses the structure according to claim 1, wherein the variable resistor is formed by at most two layers comprising the first (see Thomas Fig. 4) and second masks (see Thomas Fig. 2).

With respect to claim 20, the combination of Thomas and Look et al. discloses the structure according to claim 1, wherein the contact [54, 64] (see Thomas Fig. 3; see Thomas col. 4, lines 2-4) extends laterally away from the interconnect [12, 66] (see Thomas Fig. 1) of the mask with which the contact is formed [2-5] (see Thomas Fig. 1).

With respect to claim 21, the combination of Thomas and Look et al. discloses the system according to claim 6, wherein the contact [54, 64] (see Thomas Fig. 3; also col. 4, lines 2-4) extends laterally away from the interconnect [12, 66] (see Thomas Fig. 1) of the second mask (see Thomas Fig. 2).

With respect to claim 22, the combination of Thomas and Look et al. discloses the structure method according to claim 13, wherein the contact [54, 64] (see Thomas Fig. 3; also col. 4, lines 2-4) extends laterally away from the interconnect [12, 66] (see Thomas Fig.1) of the reference mask (see Thomas Fig. 4).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FARHANA HOQUE whose telephone number is (571)270-7543. The examiner can normally be reached on Monday - Friday 8:30-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 2831

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